



**Sandia  
National  
Laboratories**

Energy, Climate &  
Infrastructure Security

**Sandia performs applied research and bridges the gap between research institutions and industry by developing technologies that deliver cost-effective and reliable energy while also committing to the importance of environmental stewardship.**



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## Water Power Technologies and Opportunities

**Sandia leads work to optimize the cost-effectiveness and reliability of technology for marine hydrokinetic technologies (wave and current/tide) and conventional hydropower systems.**

### Sandia's Water Power Technologies Program

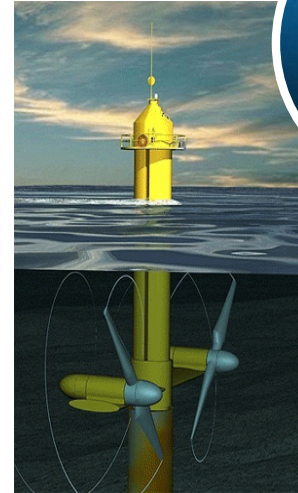
Sandia National Laboratories works to increase the viability of water power technologies by developing and advancing the science and tools needed to bring new technologies to market and evaluating methods designed to improve the performance of existing hydropower facilities. Sandia's water power program includes marine hydrokinetic, conventional hydro and offshore wind energy research efforts. Sandia has 35 years of experience in land-based wind energy, and 10 years in water resource research, with expertise in areas including high-performance computing, advanced materials and coatings, non-destructive inspection, structural optimization, innovative device architecture, complex systems simulation and large-scale testing.

### Materials Research for Water Power

As a primary element of Sandia's program, researchers focus on technical research, development and testing of coatings, renewable-appropriate composites and molding processes. This work develops and refines a variety of antimicrobial and anticorrosion materials, which seek to protect devices from maladies such as composite fatigue and biofouling, while also assessing and evaluating the materials to ensure their efficacy and reliability. By identifying and developing materials and manufacturing processes that advance the performance and reliability of both wave and current/ tidal power devices, Sandia advances the science and tools needed to commercialize new water power technologies.

### Lake Testing User Facility

Sandia maintains a large outdoor lake facility that may be enhanced for marine device testing. Running 65 meters long, 40 meters wide and 15 meters deep, this facility could provide an ideal environment for large-scale marine testing. The



lake testing user facility is particularly suitable for prototype testing and deployment of commercial devices because it helps developers predict and understand performance and reliability of marine hydrokinetic systems and devices.

### Optimizing Conventional Hydropower (CH)

In support of DOE's Water Power goals, Sandia collaborates with other national laboratories to improve simulation and optimization of CH systems to produce more energy from the available water, provide more "grid services," and enhance environmental benefits. This effort includes real-time, day-ahead, and seasonal operation analytical tools; seasonal ensemble streamflow forecasting; spatial-temporal data sets; and automated data acquisition and processing.

### Commercialization Path

Sandia looks forward to contracting with companies and research institutions to assist them with testing their ideas for new novel technologies. In addition, Sandia seeks partnerships to jointly explore new technology developments in Marine Hydrokinetics.

Please contact Daniel Laird, manager of Sandia's Water Power Technologies group, for more information.

Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000. SAND 2011-1-####P

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